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FOREST PEST MANAGEMENT

3430 BIOLOGICAL EVALUATION
R2-84-3

WESTERN TENT CATERPILLAR
BLANCO BASIN, 'V' ROCK,
CHAMA BASIN AREA
1984

United States
Department of

Forest Service

Forest Pest Management
Denver, Colorado

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BIOLOGICAL EVALUATION
WESTERN TENT CATERPILLAR
BLANCO BASIN, 'V' ROCK, CHAMA BASIN AREA

INTRODUCTION

An aerial survey of the defoliated area was made on July 23, 1984, to determine the extent of the outbreak. During the week of August 6-10, an egg mass survey was conducted to gather data for predicting the 1985 level of defoliation. At the same time, age, growth, and defect data were gathered from the sample trees at each of the sampling sites.

EVALUATION METHODS

Three trees were felled at each of fifteen sampling sites. Five new areas were sampled in addition to the same ten sites sampled in 1982 and 1983 (Table 1). Each limb was searched for new egg masses to determine the total number of egg masses per tree. In addition, two 30-inch branches from the upper crown of each tree were examined separately and the quantity of egg masses on each branch was tallied.

To determine age, growth and defect for each tree, a cross section was taken from the base and at eight-foot intervals to a four-inch top. These data will be summarized and reported at a later date.

RESULTS AND DISCUSSION

Egg mass densities are the principal tool in predicting defoliation by the western tent caterpillar. Since 1977, defoliation predictions were based on the average number of egg masses per two branch sample.

Since egg mass densities were significantly higher at the ten original sampling sites than at the five new areas sampled, data for the ten original sites were analyzed separately to facilitate comparison among years.

A summary of egg mass sampling results from the ten original sites for the years 1977 through 1984 is presented in Table 2. Egg mass densities for each of these years resulted in heavy defoliation. (Linnane 1977, 1979; Raimo 1982; Averill 1982, Raimo 1983.)

In 1984, the mean egg density in the ten original sites was 2.00 egg masses per two-branch sample indicating that heavy defoliation can be expected in 1985.

When the data from the ten original areas were combined with the data from the five new sampling areas, the mean egg mass density was 1.41 egg masses per two-branch sample (Table 3). This density is outside the range of egg mass densities that have resulted in heavy defoliation in the past; however, it should be noted that three of the five new sampling sites were along the Rito Blanco Road.

Although the area along the Rito Blanco Road was moderately defoliated in 1984, only a small number of western tent caterpillar egg masses were found at each of the three sampling sites. More prevalent were the egg masses of the large aspen tortrix, Choristoneura conflictana. (Walker) Therefore, it appears that tortrix may have been responsible for much of the defoliation at those three sites.

The egg mass density data in Table 2 indicate a downward trend in WTC populations from a peak in 1980. It is possible that declining WTC populations will provide an opportunity for the parasite/predator complex to have a greater impact on the WTC which could accelerate its downward trend.

ALTERNATIVES AND RECOMMENDATIONS

In order to more fully evaluate the impact of the WTC, the Forest should request that FPM assess the magnitude of the decline of aspen stands within the tent caterpillar outbreak area. This assessment would focus on the relationships among defoliation, tree vigor, and the occurrences of aspen diseases and mortality. This information would be valuable for predicting the impact of future aspen defoliator outbreaks as well as predicting the impact on newly infested aspen stands of this outbreak.

For a discussion of the alternatives and recommendations, please refer to the 1983 Biological Evaluation R2-83-7, "Western Tent Caterpillar, Pagosa Ranger District, San Juan National Forest, 1983."

TABLE 1. 1984 Western Tent Caterpillar Survey Data from the Rio Blanco, 'V' Rock and Chama Basin Areas

	Area (Site No.)	Tree No.	DBH (in.)	Tree Hgt. (ft.)	Crown Hgt. (ft.)	Egg Masses Per Tree	Egg Masses per 2-Branch Sample
Same Sites Sampled in 1982 and 1983	Price Lakes (1)	1	10.5	58	34	411	0.5
		2	8.4	64	31	108	3.5
		3	8.6	27	60	266	1.5
	Price Lakes (2)	1	8.6	37	20	286	1.0
		2	5.4	30	15	83	0.0
		3	8.8	38	20	439	0.5
	Road 663 (3)	1	10.8	62	17	230	5.0
		2	11.5	62	34	358	3.5
		3	13.3	83	20	328	3.0
	Road 663 (4)	1	7.6	45	16	73	0.5
		2	10.4	53	16	145	2.5
		3	9.5	57	19	220	2.0
	Road 663 (5)	1	12.8	92	24	232	4.5
		2	8.3	80	18	116	2.0
		3	10.0	89	19	132	4.0
	Blanco Basin(6)	1	10.2	76	19	61	1.0
		2	11.8	76	30	372	1.0
		3	12.7	80	29	123	1.0
	Blanco Basin (7)	1	9.9	59	25	55	0.0
		2	11.0	52	19	69	0.5
		3	7.9	51	19	46	1.5
	Blanco Basin (8)	1	9.7	76	24	216	1.0
		2	12.3	74	26	201	1.0
		3	13.2	72	43	334	0.0
	Blanco Basin (9)	1	9.2	69	20	68	1.5
		2	12.3	74	24	104	.5
		3	12.0	71	21	195	2.0
	Mtn. Bird Ranch (10)	1	7.8	56	27	61	2.0
		2	9.5	53	30	392	8.5
		3	7.9	61	30	72	5.0
New Sampling Sites	Rio Chama Rd. (11)	1	10.5	79	17	46	0.0
		2	10.0	70	32	10	0.0
		3	6.7	61	24	5	0.0
	Rio Chama Rd. (12)	1	7.9	75	19	33	0.0
		2	6.5	62	13	0	0.0
		3	13.6	83	21	63	2.0
	Rito Blanco (13)	1	13.2	73	23	19	0.0
		2	7.3	55	23	3	1.0
		3	8.1	43	17	7	0.0
	Rito Blanco (14)	1	8.7	62	26	18	0.0
		2	11.1	72	32	55	0.5
		3	8.4	67	34	13	0.0
	Rito Blanco (15)	1	7.5	54	18	1	0.0
		2	4.6	37	30	0	0.0
		3	14.8	78	43	17	0.0

TABLE 2. Summary of Western Tent Caterpillar Egg Mass Data from 30-inch Branch Samples from the 10 Original Sites on the Pagosa Ranger District, 1977-84. (See Table 1)

	Year of Oviposition							
	1977	1978	1979	1980	1981	1982 */	1983	1984 ¶/
Number of trees samples	34	37	88	88	84	--	30	30
Total number of egg masses	192	147	422	622	454	--	135	120
Average no. of egg masses per two-branch sample	2.84	1.97	2.40	3.28	3.21	--	2.25	2.00
Standard Error	0.47	0.47	0.25	0.33	0.39	--	0.53	0.35
95% Confidence Limits	±0.96	±0.81	±0.50	±0.65	±0.77	--	±1.04	±0.71 §/
Defoliation	Heavy	Heavy	Heavy	Heavy	Heavy	--	Heavy	Predicted Heavy †/

¶/ The 1984 data displayed in this table are from the same areas sampled in 1983.

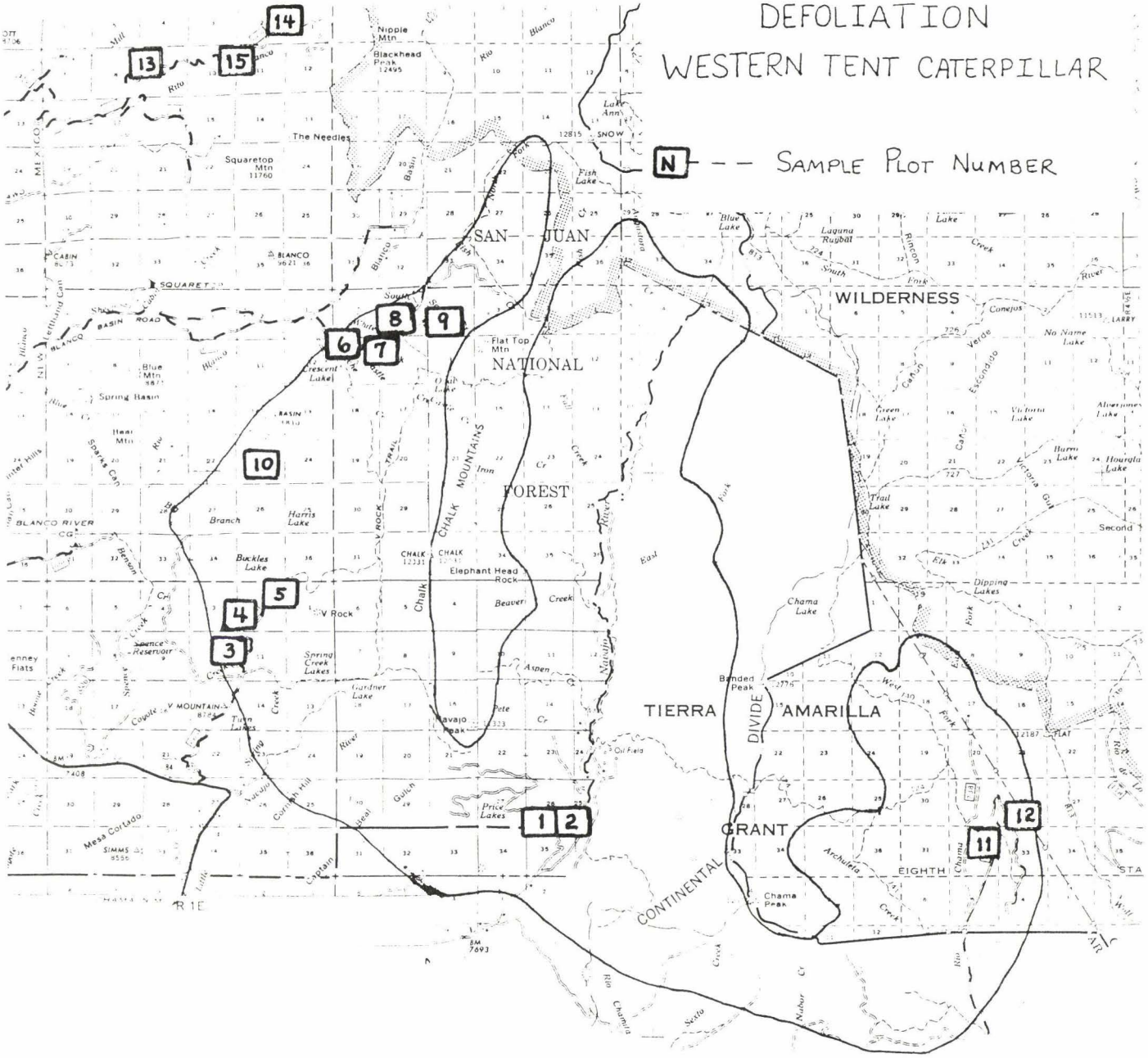
§/ The probability that the mean egg mass density lies between 1.29 and 2.71 egg masses per two branch sample is about 95%.

†/ Heavy defoliation is predicted since the average number of egg masses per two-branch sample found in 1984 falls within the range of egg mass densities that have resulted in heavy defoliation in the past.

*/ Only total egg masses per tree data were collected in 1982.

TABLE 3. Summary of Western Tent Caterpillar Egg Mass Data from 30-inch Branch Samples from ALL FIFTEEN Sites Sampled in 1984 (see Table 1).

	Year of Oviposition 1984
Number of Trees Sampled	45
Total Number of Egg Masses	127
Average No. of Egg Masses per Two-Branch Sample	1.411
Standard Error	0.326
95% Confidence Limits	0.538


DEFOLIATION
WESTERN TENT CATERPILLAR
N - - - SAMPLE PLOT NUMBER
14
13
15
8
9
6
7
10
5
4
3
1
2
12
11
SAN JUAN
NATIONAL
FOREST
WILDERNESS
TIERRA AMARILLA
DIVIDE
GRANT
CONTINENTAL
EIGHTH
Nipple Mtn
Blackhead Peak 12495
The Needles
Squaretop Mtn 11760
Flat Top Mtn
Blue Mtn
Spring Basin
Buckles Lake
Harris Lake
V Rock
Chalk Mountains
Elephant Head Rock
Spring Creek Lakes
Gardner Lake
Navajo Peak
Price Lakes
Mesa Cortado
Blue Lake
Laguna Rugbal
Conejos
No Name Lake
Green Lake
Victoria Lake
Trail Lake
Dipping Lakes
Chama Lake
Banded Peak
Chama Peak
Archuleta
Second
BLANCO RIVER
SQUARETOP
BLANCO BASIN ROAD